Complete Summary

GUIDELINE TITLE

Practice management guidelines for the evaluation of blunt abdominal trauma.

BIBLIOGRAPHIC SOURCE(S)

EAST Practice Management Guidelines Work Group. Practice management guidelines for the evaluation of blunt abdominal trauma. Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2001. 27 p. [68 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Blunt abdominal trauma

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Emergency Medicine
Gastroenterology
Internal Medicine
Radiology
Surgery

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To develop an evidence-based systematic diagnostic approach to blunt abdominal trauma (BAT) utilizing the three major modalities: i.e., diagnostic peritoneal lavage (DPL), computed tomography (CT), and focused abdominal sonography for trauma (FAST) (This diagnostic regimen would be designed such that it could be reasonably applied by all general surgeons performing an initial evaluation of blunt abdominal trauma.)

TARGET POPULATION

Patients who have sustained blunt abdominal trauma

INTERVENTIONS AND PRACTICES CONSIDERED

1. Exploratory laparotomy
2. Computed tomography (CT)
3. Diagnostic peritoneal lavage (DPL)
4. Focused abdominal sonography for trauma (FAST)
5. Splanchnic (visceral) angiography
6. Diagnostic laparoscopy (considered but no recommendations given)

MAJOR OUTCOMES CONSIDERED

Sensitivity and specificity of diagnostic modalities in evaluation of patients with blunt abdominal trauma

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developers performed a MEDLINE search using the key words "abdominal injuries" and the subheading "diagnosis". This search was limited further to (1) clinical research, (2) published in English, (3) publication dates January 1978 through February 1998. The initial search yielded 742 citations. Case reviews, review articles, meta-analyses, editorials, letters to the editor, technologic reports, pediatric series and studies involving a significant number of penetrating abdominal injuries were excluded prior to formal review. Additional references, selected by the individual subcommittee members, were then included to compile the master reference list of 197 citations.

NUMBER OF SOURCE DOCUMENTS

101 articles

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Evidence Classification Scheme:

Class I: Prospective, randomized, double-blinded study.

Class II: Prospective, randomized, non-blinded trial.

Class III: Retrospective series, meta-analysis

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Articles were distributed among subcommittee members for formal review. A review data sheet was completed for each article reviewed which summarized the main conclusions of the study, and identified any deficiencies in the study. Further, reviewers classified each reference by the methodology established by the Agency for Health Care Policy and Research (AHCPR) of the U.S. Department of Health and Human Services as follows:

Class I: Prospective, randomized, double-blinded study

Class II: Prospective, randomized, non-blinded trial

Class III: Retrospective series, meta-analysis

Following review by the subcommittee, references were excluded based on poor design or invalid conclusions. An evidentiary table was constructed using the remaining 101 references: Class I (20); Class II (32); Class III (49). Recommendations were based on studies included in the evidentiary table.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Level I: The recommendation is convincingly justifiable based on the available scientific information alone. This recommendation is usually based on Class I data, however, strong Class II evidence may form the basis for a Level I recommendation, especially if the issue does not lend itself to testing in a

randomized format. Conversely, low quality or contradictory Class I data may not be able to support a Level I recommendation.

Level II: The recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert opinion. This recommendation is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft document is submitted to all members of the panel for review and modification. Subsequently the guidelines are forwarded to the chairmen of the Eastern Association of Trauma ad hoc committee for guideline development. Final modifications are made and the document is forwarded back to the individual panel chairpersons.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Level of recommendations (I-III) and the class of data grading (I-III) are defined at the end of the "Major Recommendations" field.

Injury to intra-abdominal viscera must be excluded in all victims of blunt abdominal trauma (BAT). Physical examination remains the initial step in diagnosis but has limited utility under select circumstances. Thus, various diagnostic modalities have evolved to assist the trauma surgeon in the identification of abdominal injuries. The specific tests selected are based on the clinical stability of the patient, the ability to obtain a reliable physical examination and the provider´s access to a particular modality. It is important to emphasize that many of the diagnostic tests utilized are complementary rather than exclusionary.

A reasonable diagnostic approach to blunt abdominal trauma is summarized in Figures 1 and 2 of the original guideline document. In hemodynamically stable patients with a reliable physical examination, clinical findings may be used to select patients who may be safely observed. In the absence of a reliable physical

examination, the main diagnostic choice is between computed tomography or focused abdominal sonography for trauma (with computed tomography in a complementary role). Hemodynamically unstable patients may be initially evaluated with focused abdominal sonography for trauma (FAST) or diagnostic peritoneal lavage (DPL).

A. Level I Recommendations
    1. Exploratory laparotomy is indicated for patients with a positive diagnostic peritoneal lavage (DPL).
    2. Computed tomography (CT) is recommended for the evaluation of hemodynamically stable patients with equivocal findings on physical examination, associated neurologic injury, or multiple extra-abdominal injuries. Under these circumstances, patients with a negative computed tomography scan should be admitted for observation.
    3. Computed tomography is the diagnostic modality of choice for nonoperative management of solid visceral injuries.
    4. In hemodynamically stable patients, diagnostic peritoneal lavage and computed tomography are complementary diagnostic modalities.
B. Level II Recommendations
    1. Focused abdominal sonography for trauma (FAST) may be considered as the initial diagnostic modality to exclude hemoperitoneum. In the presence of a negative or indeterminate focused abdominal sonography result, diagnostic peritoneal lavage and computed tomography have complementary roles.
    2. When diagnostic peritoneal lavage is used, clinical decisions should be based on the presence of gross blood on initial aspiration (i.e., 10 ml) or microscopic analysis of lavage effluent.
    3. In hemodynamically stable patients with a positive diagnostic peritoneal lavage, follow-up computed tomography scan should be considered, especially in the presence of pelvic fracture or suspected injuries to the genitourinary tract, diaphragm or pancreas.
    4. Exploratory laparotomy is indicated in hemodynamically unstable patients with a positive focused abdominal sonography for trauma scan. In hemodynamically stable patients with a positive focused abdominal sonography for trauma scan, follow-up computed tomography permits nonoperative management of select injuries.
    5. Surveillance studies (i.e., diagnostic peritoneal lavage, computed tomography, repeat focused abdominal sonography for trauma) are required in hemodynamically stable patients with indeterminate abdominal sonography for trauma results.
C. Level III Recommendations
    1. Objective diagnostic testing (i.e., focused abdominal sonography for trauma, diagnostic peritoneal lavage, computed tomography) is indicated for patient with abnormal mentation, equivocal findings on physical examination, multiple injuries, concomitant chest injury or hematuria.
    2. Patients with seatbelt sign (SBS) should be admitted for observation and serial physical examination. Detection of intraperitoneal fluid by focused abdominal sonography for trauma or computed tomography in a patient with seatbelt sign mandates either diagnostic peritoneal lavage to determine the nature of the fluid or exploratory laparotomy.
    3. Computed tomography is indicated for the evaluation of suspected renal injuries.

4. A negative focused abdominal sonography for trauma should prompt follow-up computed tomography for patients at high risk for intraabdominal injuries (e.g., multiple orthopedic injuries, severe chest wall trauma, neurologic impairment).
5. Splanchnic angiography may be considered in patients who require angiography for the evaluation of other injuries (e.g., thoracic aortic injury, pelvic fracture).

Definitions:

Recommendation Scheme:

Level I: The recommendation is convincingly justifiable based on the available scientific information alone. This recommendation is usually based on Class I data, however, strong Class II evidence may form the basis for a Level I recommendation, especially if the issue does not lend itself to testing in a randomized format. Conversely, low quality or contradictory Class I data may not be able to support a Level I recommendation.

Level II: The recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert opinion. This recommendation is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

Classification Scheme:

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Class III: Retrospective series, meta-analysis

CLINICAL ALGORITHM(S)

The original guideline document contains clinical algorithms for:

- Evaluation of Blunt Abdominal Trauma: Unstable Patient
- Evaluation of Blunt Abdominal Trauma: Stable Patient

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Conclusions were based on evidence obtained from prospective randomized studies (Class I); prospective, non-comparative studies; retrospective series with controls (Class II); or retrospective analyses (case series, databases or registries,

case reviews (Class III). The evidentiary tables included twenty-three Class I references, thirty-five Class II references, and sixty-three Class III references.

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Diagnostic Peritoneal Lavage

- Studies have confirmed the efficacy of diagnostic peritoneal lavage in diagnosing abdominal hemorrhage as well as its superiority over physical examination alone. The accuracy of diagnostic peritoneal lavage has been reported between 92% and 98%. The high sensitivity of diagnostic peritoneal lavage is due to the significant false positive rate of the technique. Diagnostic peritoneal lavage has been shown to be more efficient than computed tomography scan in identifying patients that require surgical exploration.
- The advantages of diagnostic peritoneal lavage for detection of hollow visceral injuries have been clearly demonstrated. Two studies which advocate analysis of diagnostic peritoneal lavage fluid for amylase and alkaline phosphatase consistent with enteric injuries have been disputed. Similarly, the utility of the diagnostic peritoneal lavage white blood cell (WBC) count has been questioned. Diagnostic peritoneal lavage is sensitive for mesenteric injury and, in fact, has been shown to be superior to computed tomography for the diagnosis of this injury.

Computed Tomography

- The accuracy of computed tomography in hemodynamically stable blunt trauma patients has been well established. Sensitivity between 92% and 97.6% and specificity as high as 98.7% has been reported in patients subjected to emergency computed tomography. Most authors recommend admission and observation following a negative computed tomography scan. In a recent study of 2774 patients, the authors concluded that the negative predictive value (99.63%) of computed tomography was sufficiently high to permit safe discharge of blunt abdominal trauma patients following a negative computed tomography scan.
- Computed tomography has the unique ability to detect clinically unsuspected injuries. In a series of 444 patients in whom computed tomography was performed to evaluate renal injuries, 525 concomitant abdominal and/or retroperitoneal injuries were diagnosed. Another advantage of computed tomography scanning over other diagnostic modalities is its ability to evaluate the retroperitoneal structures. Kane et al (Efficacy of CT following peritoneal lavage in abdominal trauma. J Comp Asst Tomo 1987;11:998-1002) performed computed tomography in 44 hemodynamically stable blunt trauma patients following diagnostic peritoneal lavage. In 16 patients, computed tomography revealed significant intra-abdominal or retroperitoneal injuries not diagnosed by diagnostic peritoneal lavage. Moreover, the findings on

computed tomography resulted in a modification to the original treatment plan in 58% of the patients.

Focused Abdominal Sonography for Trauma (FAST)

- The advantages of the focused abdominal sonography for trauma examination have been clearly established. Focused abdominal sonography for trauma is noninvasive, may be easily performed and can be done concurrently with resuscitation. In addition, the technology is portable and may be easily repeated if necessary. In most cases, focused abdominal sonography for trauma may be completed within 3 or 4 minutes. The test is especially useful for detecting intra-abdominal hemorrhage in the multiply injured or pregnant patient.
- Ultrasound has been shown to be more cost-effective when compared to diagnostic peritoneal lavage or computed tomography.

  Overall, focused abdominal sonography for trauma has a sensitivity between 73% and 88%, a specificity between 98% and 100% and is 96% to 98% accurate. This level of accuracy is independent of the practitioner performing the study.

POTENTIAL HARMS

Diagnostic Peritoneal Lavage

- Complications can occur with diagnostic peritoneal lavage, although the complication rate is quite low. The incidence of complications is lower for open diagnostic peritoneal lavage compared to the closed technique.
- Diagnostic peritoneal lavage does not reliably exclude significant injuries to retroperitoneal structures. False positive results may occur in the presence of pelvic fractures.

Computed Tomography

- Computed tomography is notoriously inadequate for the diagnosis of mesenteric injuries and may also miss hollow visceral injuries.

Focused Abdominal Sonography for Trauma (FAST)

- Ultrasound is not a reliable method for excluding hollow visceral injury.
- The focused abdominal sonography for trauma examination cannot be used to reliably grade solid organ injuries.

Subgroups Most Likely to Be Harmed:

- Patients with red blood cell counts in the equivocal rate (i.e., 25,000 to 75,000 red blood cells/mm^3) (false positives for diagnostic peritoneal lavage)
- Patients at risk for mesenteric or hollow visceral injury (inadequacy of computed tomography and ultrasound)

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The guideline developers make the following recommendations regarding implementation:

Implementation involves extensive education and inservicing of nursing, resident, and attending staff members and has one important guiding principle: the guidelines must be available to the clinicians in real time while they are actually seeing the patient. The two most common ways to apply these are by using either a critical pathway or a clinical management protocol. A critical pathway is a calendar of expected events that has been found to be very useful within designated diagnosis-related groups. In trauma, where there are multiple diagnosis-related groups used for one patient, pathways have not been found to be easily applied with the exception of isolated injuries. Clinical management protocols, on the other hand, are annotated algorithms that answer the "if, then" decision making problems and have been found to be easily applied to problem-, process-, or disease-related topics. The clinical management protocol consists of an introduction, an annotated algorithm and a reference page. The algorithm is a series of "if, then" decision making processes. There is a defined entry point followed by a clinical judgment and/or assessment, followed by actions, which are then followed by outcomes and/or endpoints. The advantages of algorithms are that they convey the scope of the guideline, while at the same time organize the decision making process in a user-friendly fashion. The algorithms themselves are systems of classification and identification that should summarize the recommendations contained within a guideline. It is felt that in the trauma and critical care setting, clinical management protocols may be more easily applied than critical pathways, however, either is acceptable provided that the formulated guidelines are followed. After appropriate inservicing, a pretest of the planned guideline should be performed on a limited patient population in the clinical setting. This will serve to identify potential pitfalls. The pretest should include written documentation of experiences with the protocol, observation, and suggestions. Additionally, the guidelines will be forwarded to the chairpersons of the multi-institutional trials committees of the Eastern Association for the Surgery of Trauma, the Western Association for the Surgery of Trauma, and the American Association for the Surgery of Trauma. Appropriate guidelines can then be potentially selected for multi-institutional study. This process will facilitate the development of user friendly pathways or protocols as well as evaluation of the particular guidelines in an outcome based fashion.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

EAST Practice Management Guidelines Work Group. Practice management guidelines for the evaluation of blunt abdominal trauma. Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2001. 27 p. [68 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001

GUIDELINE DEVELOPER(S)

Eastern Association for the Surgery of Trauma - Professional Association

SOURCE(S) OF FUNDING

Eastern Association for the Surgery of Trauma (EAST)

GUIDELINE COMMITTEE

EAST Practice Management Guidelines Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Work Group Members: William S. Hoff, MD; Michelle Holevar, MD; Kimberly Nagy, MD; Lisa Patterson, MD; Jeffrey S. Young, MD; Abenamar Arrillaga, MD; Micheal P. Najarian, DO; Carl P. Valenziano, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Eastern Association for the Surgery of Trauma (EAST) Web site.

Print copies: Available from the EAST Guidelines, c/o Fred Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Practice management guidelines for trauma: East Ad Hoc Committee on Guideline Development (Unabridged: Revised 1998 Mar 20). Available from the Eastern Association for the Surgery of Trauma (EAST) Web site.

An excerpt is also available:

- Pasquale M, Fabian TC. Practice management guidelines for trauma from the Eastern Association for the Surgery of Trauma. J Trauma 1998 Jun;44(6):941-56; discussion 956-7.

Also available:

- Utilizing evidence based outcome measures to develop practice management guidelines: a primer. Allentown (PA): Eastern Association for the Surgery of Trauma; 2000. 18 p. Available from the EAST Web site.

Print copies: Available from the EAST Guidelines, c/o Fred Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on February 27, 2002. The information was verified by the guideline developer as of March 26, 2002.

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